

## PUBLIC HEALTH

UDC 611.01

**The role of Dutch representatives in the development of medicine in Russia from the 9<sup>th</sup> to the 13<sup>th</sup> century***I. F. Hendriks<sup>1</sup>, J. G. Bovill<sup>1</sup>, D. A. Zhuravlev<sup>2</sup>,  
I. V. Gaivoronsky<sup>3</sup>, F. Boer<sup>1</sup>, P. C. W. Hogendoorn<sup>1</sup>*<sup>1</sup> Leiden University Medical Centre,  
2, Albinusdreef, ZA Leiden, 2333, Netherlands<sup>2</sup> Military Medical Museum,  
2, Lazeretnyi per., St. Petersburg, 191180, Russian Federation<sup>3</sup> S. M. Kirov Military Medical Academy,  
6, ul. Akademika Lebedeva, St. Petersburg, 194044, Russian Federation

**For citation:** Hendriks I. F., Bovill J. G., Zhuravlev D. A., Gaivoronsky I. V., Boer F., Hogendoorn P. C. W. The role of Dutch representatives in the development of medicine in Russia from the 9<sup>th</sup> to the 13<sup>th</sup> century. *Vestnik of Saint Petersburg University. Medicine*, 2019, vol. 14, issue 1, pp.49–57. <https://doi.org/10.21638/11701/spbu10.2019.106>

This article presents the period of development of medicine in Russia from the beginning of the 9<sup>th</sup> century until the end of the 18<sup>th</sup> century. Before 1613, most of the population in Russia did not have access to qualified medical care and relied on traditional folk remedies. After conversion of Kievan Rus' to Byzantium Christianity, monks provided basic medical care in the monasteries along with folk healers. At the same time, the ruling classes had access to qualified medical assistance, which was provided by foreign physicians. During the reign of Mikhail Fyodorovich Romanov (1613–1645) many foreign doctors were invited to Russia, including representatives of the Netherlands, graduates of the Leiden University. The development of medical education in European areas was largely carried out by foreign doctors, in particular, doctors from Holland. Hermann Kaau-Boerhaave and Pavel Zakharievich Condoidi, Dutch representatives and graduates of the Leiden University played a particularly important role in the development of Russian Medicine in the 18<sup>th</sup> century. In 1654 the first medical school was opened in Russia. State institutions were established to organise and supervise the work of pharmacists, doctors *medicinae* and barber-surgeons. The treatment of patients in the 17–18<sup>th</sup> centuries advanced from primitive folk to more advanced methods based on science including surgical interventions.

**Keywords:** history, medicine, Peter the Great, Bidloo, Boerhaave, The Netherlands, Russia (pre-1917).

## Folk medicine and the role of the monasteries during Kievan Rus'

In order to better understand the history of medicine in Russia it is helpful to understand the history and the geography of that nation [1; 2]. For centuries, Russia varied between an open and an isolated country, and this is also reflected in the development of medicine. Russia is located on two continents: in the West on Europe and in the East on Asia. Ancient Russia was connected in the north with Scandinavia and in the south with Byzantium. The emergence of Kievan Rus' as a feudal state with its capital in Kiev dates from the second half of the ninth century [3; 4].

Till the end of the ninth century, the majority of Russians had no access to qualified medical care, and relied on traditional folk and herbal remedies [1; 3; 5]. With the conversion of the Kievan Rus' state to Byzantium Christianity in 988 many monasteries were established, some of which also functioned as centres of education. Through Bulgaria and Byzantium, ancient and early medieval manuscripts came to Kiev. Monks and chroniclers, like Nestor, translated them to the Slavic language. They knew Latin and Greek and not only collected Greek and Byzantine manuscripts, but also, added their own knowledge based on local folk experience.

In addition, it was the monks who offered basic medical care for the poor and needy.

The oldest and most famous monastery at that time was the Pecherskaya Monastery<sup>1</sup> or "Monastery of the Caves" in Kiev [1; 3; 4; 6–9]. It received wounded and needy with all kinds of diseases from all over Kievan Rus'. For the most serious cases the monastery hospital had a special ward, where monks on duty provided the basic care for the sick.

Some monks specialized in the treatment of specific diseases; for example Alimpiy treated patients with skin diseases and Demyan treated children. In the eleventh century, many monks made a pilgrimage to the monastery on Mount Athos in Greece. On their return they put into practice the rudimentary medical skills they had learned there.

The monks were not the only practicing healers. By the mid-eleventh century secular medical tradition began to develop. In cities and at the court of princes and boyars (noblemen) were secular Russian and foreign folk healers called lechtsy (лечцы).

These healers used traditional medicine in their practice and passed their medical knowledge and secrets from generation to generation, from father to son in the so-called family medical schools. Widespread use was made of herbal remedies derived from plants such as sage, nettle, plantain and wild rosemary, as well as from animal products, such as honey and fish oil.

Folk healers were well aware of the healing power of the banya (sauna), which was the cleanest room in the house and was used for caring and cleaning the body, phlebotomy, massage, delivering a child and caring for the new-born. Because of the banya is still very popular in Russia. Over time, people began to recognise the work of traditional healers.

In the oldest Russian legislation, the "Russian Truth", framed between 1113–1125, is written that a person who inflicted damage to the health of another person had to pay a sum of money to the state treasury, so the victim could pay for the treatment.

The decline in the development of Medicine during the Mongol Yoke.

Kievan Rus' lasted for three centuries until 1132. After the death of the last Prince of Kiev the country broke up into several small feudal principalities. Subsequently, Ki-

---

<sup>1</sup> We have used common English transcription for the Russian language among others the names "Печерская лавра" and "Алимпий".

evan Rus' lost its political independence and was isolated from Europe as a result of the invasion of the Mongol-Tatar yoke, known as the Golden Horde. However, the continued resistance of the population did not allow the Moguls to create a strong Mongolian state in Russia. The princes of the Grand Duchy of Moscow led the reunification of the Russian lands, gradually strengthening its power. The unification was completed only in 1480 by Tsar Ivan III (1462–1505) after the final overthrow of the Mongolian yoke in the Battle of Moscow. Now Moscow became the political capital of the country, and the new state Muscovy arose.

During the Mongolian rule, which lasted from 1224 to 1380, foreign physicians virtually disappeared. They began to return only during the reign of Tsar Ivan III (1462–1505).

### **From rural to pharmaceutical medication in Muscovy (1481–1662)**

After the victory over the Mongols, the new state of Muscovy sought for decades to re-establish contact with Europe through the free port of Archangelsk. The first Muscovite emperor, Tsar Vasily Ivanovich III (1505–1533), established at his court the position of physician, that was occupied by several foreign doctors, among them Nikolay Lübeck (Nicolaus Bülow) from Lübeck, the brothers Markvart (Marquart) from Königsberg and Teofil (Theophil), a captured Prussian doctor [4; 7; 10; 11]. These doctors were advisers at the imperial pharmacy.

Nevertheless, from the correspondence between the Grand Duke and his wife it was obvious that in case of illness of their children they trusted the empirical experience of the Grand Duchess more than the doctors.

The successor of Vasily III, Tsar Ivan Vasilievich IV (1534–1584), known as Ivan the Terrible, developed trade with England and other countries [4; 12; 13]. The connections gradually expanded, including in medicine. Since 1550, in many cities hospitals were built to serve elderly and sick people. Ivan IV invited the first doctors with a Doctors Medicinae degree (comparable to a MD, PhD degree) to Russia, including the brothers Arnold and Robert Lindsay and the pharmacist James Frencham from England. He also hired in 1557 the pharmacist Arend Claessen van Stellingwerff from Holland. Despite the fact that Van Stellingwerff arrived in Russia first and worked as a court pharmacist for 40 years, the Englishman James Frencham was appointed as head of the first Imperial Pharmacy, that officially was opened in Moscow in 1581. Frencham returned to England in 1583, but in 1602 he was again invited to Russia by Tsar Boris Fyodorovich Gudonov (1598–1605). This time Frencham brought to Russia a valuable collection of not only conventional, but more or less common drugs such as opium, camphor and Senna leaves. After the death of Tsar Boris and the accession of the first Tsar of the Romanov dynasty, Mikhail Fyodorovich (1613–1645), a seven-year civil war broke out in Russia, demanding medical assistance to the wounded.

With the development of book printing, scientific European knowledge became available, such as those of Aristotle, Hippocrates, Celsus and Galen. Tsar Ivan the Terrible and other Russian noblemen contributed to the development of book printing, buying abroad printing presses [7]. The first handwritten book on medicine of Roman origin was translated in 1423 into Polish and appeared in a Russian translation by Thomas A. Buturlin in 1588 [4; 5; 7]. This textbook contained 1561 pages with drawings of herbs, trees, animals, including illustrations for the distillation of cognac, bloodletting, hairdressing saloons and

pharmacies. In 1616 German herb catalogues with colour drawings were translated into Russian and in 1661 these books were provided to the Aptekarskiy Prikaz<sup>2</sup>. They became available to doctors, surgeons and pharmacists in Russia. In 1812, during the invasion of Napoleon's troops in Moscow, these rare books and most of the archive of the Aptekarskiy Prikaz, like many other things, were destroyed by fire [4; 14].

Tsar Aleksey Mikhailovich (1645–1676) owned two Imperial Pharmacies in Moscow. The old pharmacy was located in the Kremlin and served the Imperial family and supplied almost nothing to private individuals [5; 12; 13]. The new pharmacy, located in the city centre, had a significant turnover and employed several qualified pharmacists, who were responsible to the Aptekarskiy Prikaz. The tsar had three herb gardens laid out in Moscow most with widely used herbs. Fresh herbs were also obtained from the surrounding villages. The gardeners were supposed to inform in writing the Aptekarskiy Prikaz on the first of April, which seeds and quantity were needed, and in November to send a written report on the harvest crop. The Imperial pharmacies cultivated also such local herbs as *Symphytum majus*, *Helleborus Niger*, *Hypericum*, *Anisum stellatum*, saltpetre and rhubarb. However, herbs still had to be imported from abroad.

In the 1660's two wars broke out between England and Holland, of which the cause was the control of trade routes with Russia [8; 13]. This led to the fact that, in the second half of the seventeenth century, the Dutch took over the leading market position for the export and sale of pharmaceuticals. Special employees of the Prikaz were appointed to ensure the supplies of these products, as well as the accounting. They were responsible for providing the pharmacists and physicians with the ingredients needed for the manufacture of medicines, as indicated in the prescription in the Aptekarsky Prikaz and also provided financial statements for the last year [14].



Fig. 1. The building of the Aptekarskiy Prikaz in the Moscow Kremlin, pen and ink drawing, artist Margarita V. Apraksina, St. Petersburg, 2016. First author is owner of the drawing.

<sup>2</sup> Historical meaning for “Приказ” is “Ministry” according to the dictionaries by S.I. Ozhegov — N. Yu. Chvedova and by V. Dal’.



Tsar Peter the Great (1662–1725) inherited the two family pharmacies, and replaced the central pharmacy by a new stone building and refurbished it along European standards (Fig. 1). In 1705 he allowed eight private pharmacies to be established in Moscow. Their owners held a free license and could sell all types of medicines with the exception of wine and other non-medical liquids to the general public. Pharmacies were also opened in Kazan, Gluchow, Riga and Reval (now Tallinn in Estonia). The pharmacy in St. Petersburg was opened only in 1760, despite the fact that in 1703 it became the new capital of Russia. Such a delay was due to the dominance of the state pharmacy system and the slow growth of the population in the city [12; 13]. The Tsar also had garrison pharmacies opened in several small villages. After his second visit to Europe in 1717, Peter in St. Petersburg laid out two medicinal herb gardens and paid for the production of local medicines and medical products in several new, purpose built factories [6; 12].

## The development of progressive Medicine in Russia

Tsar Mikhail Fyodorovich (1613–1645), the first reigning Romanov, instituted improvements in social welfare and public healthcare. In 1620, he established the Aptekar-skiy Prikaz (Ministry of Pharmacy) in Moscow [4; 5; 13]. An aristocratic landowner and member of the feudal aristocracy (Boyars) was appointed as minister. His secretary was obliged to report on the state of affairs on a daily basis.

The Prikaz provided the control over the development of medicine and public health:

- It comprised three professional groups, pharmacists, doctors *medicinae* and barber-surgeons (*lekars*).
- It examined pharmacists and doctors *medicinae*, as well as their registration. Foreign doctors could be admitted to Russia only after approval by the Prikaz. They had to present their diplomas and had to pass successfully an examination to confirm their competence to practice.
- It was also responsible for the daily stock of medical supplies, as well as organizing the military pharmacies, the payment of medical personnel and the resolution of court cases [12]. Only one person within the Prikaz was authorised to purchase medical instruments and drugs from abroad, most often from the Netherlands<sup>3</sup>, Great Britain and Germany [7; 13; 15].
- Another important task of the Prikaz was to protect the population from epidemics such as the bubonic plague. However, the steps taken were often insufficient and weak. For soldiers, civil servants and boyars standard care was developed, carried out according to treatment protocols [5; 12]. After investigation by a barbersurgeon, patients received a written injury report along with the prescription and presented them to the Prikaz to receive a medication paid by the state.

In 1654, the Prikaz opened the first medical school with the participation of court physicians and foreign medical doctors providing the education process [6; 16; 17]. Instructions were given in anatomy, surgery, pharmacology, practical diagnosis of internal diseases and ambulatory medicine. In 1658, out of 30 selected students only 13 graduated. In 1717 this school was closed by Tsar Peter the Great.

---

<sup>3</sup> We have chosen for today's names of countries to make it less complicated for the reader.

In Russia in the sixteenth and seventeenth centuries, pharmacists had the primary responsibility for healthcare. Medicine had become more complex. It changed from external use of medicinal herbs to medicines in combination with surgical treatments. After his visits to Europe, Peter the Great introduced several innovations, including the appointment of doctors *medicinae* as decision makers in the healthcare system. This was continued by his successors.

In 1707 Tsar Peter renamed the Aptekarskiy Prikaz to Aptekarskaya Kantselyariya<sup>4</sup> (Pharmaceutical Chancellery). In 1725 it underwent yet name change to Meditsinskaya Kantselyariya (Medical Chancellery) [6; 7; 17]. In 1712 a large part of the Aptekarskaya Kantselyariya was moved to the new capital St. Petersburg and the budget was also increased to cover the staff salaries and the higher prices of imported drugs. In 1716 Tsar Peter appointed by crown the first Arkhiyater of the Chancellery, which was the synonymous for Minister of Healthcare. Thus, from that time the title “Arkhiyater” became reserved for the senior civil servant or politician with responsibilities for health care.

The first of these new style Arkhiyaters was the Scotsman Robert Erskine, who from 1713 had been court physician to Peter the Great. The Tsar elevated him to a privy councillor for his “many and most faithful services” — a mark of high distinction. Erskine had studied in Paris before moving to the Netherlands, where he graduated as Doctor *Medicinae* from the Utrecht University in 1700. Erskine and his successors were tasked with the responsibility for all health care activities in Russia, as well as monitoring the activities of all doctors, surgeons and pharmacists working for the state.

Along with the renaming of the Aptekarskiy Prikaz to first Aptekarskaya Kantselyariya and in 1725 to Meditsinskaya Kantselyariya the title of governors also changed. The post of Arkhiyater was renamed to President, and in 1725 to General Director [6; 18]. From 1716 till 1763 Russia counted four Arkhiyaters and four General Directors, of whom half were graduates of the Leiden University. They radically transformed Russian medicine.

On the recommendation of the Portuguese António Nunes Ribeiro Sanchez, personal physician of Tsarina Anna Ivanovna (1730–1740), the Dutchman Herman Kaau-Boerhaave was invited to become the court physician of the Tsarina [5; 6; 18]. Sanchez was a graduate of Leiden and a pupil of the famous Dutchman Herman Boerhaave. Herman Kaau accepted the invitation and moved to St. Petersburg with his family at the end of 1741. He was one of the four general directors of the Meditsinskaya Kantselyaria. His parents were, Margriet Boerhaave, sister of Herman Boerhaave and doctor Jacob Kaau. Herman's nephew became the heir of his uncle Herman Boerhaave, who had only a daughter, so he attached the family name Boerhaave to his surname.

In 1744 Herman Kaau-Boerhaave was appointed to the state council. On 7 December 1748 Tsarina Elizabeth the Great (1741–1761) appointed him as a member of the State Council of Russia and became the first personal physician and General Director of the Meditsinskaya Kantselyariya. He died in Moscow on 7 October 1753 and on the direct order of the Tsarina his body was interred in a vaulted crypt in the Old Dutch Church. His remains were moved to the Moscow cemetery on 20 May 1815.

Herman Kaau-Boerhaave, like his uncle, had no male heirs and his younger brother Abraham Kaau became his sole heir. In 1740 with the permission of the daughter of Herman Boerhaave, countess De Thoms-Boerhaave, Abraham also changed his surname to

---

<sup>4</sup> Historical meaning for «Канцелярия» is “Chancellery” according to the dictionaries by S. I. Ozhegov — N. Yu. Shvedova and by V. Dal'.

Kaau-Boerhaave. Both brothers had studied medicine in Leiden under the guidance of their uncle Herman Boerhaave and both made successful careers in Russia.

Pavel Zakharievich Condoidi (1710–1760) of Russian-Greek roots was sent from Russia to Leiden to study medicine, where he graduated as Doctor Medicinae in 1733 [6; 17; 19]. On his return to Russia he initially worked as a military doctor, then as a general staff doctor. As an honorary member of the Imperial Academy of Science he succeeded Herman Kaau-Boerhaave in 1753 as General Director of the Meditsinskaya Kantselyariya, a post he held almost to the end of his life in 1760. During his tenure he introduced a seven-year training program, a new examination system and also added courses in physiology, obstetrics, women's and children's diseases to the curriculum of medical schools. Another achievements of his was the establishment of the first Russian Medical Library in 1756.

Tsarina Elizabeth the Great (1741–1762) issued in 1756 a law, that allowed only those doctors to practice medicine, who officially were registered by the Meditsinskaya Kantselyariya [5; 6]. It was expressly forbidden to provide any oral drugs without the signature of a qualified doctor. Thus, now medical practice was prohibited to unqualified doctors (folk healers). The Meditsinskaya Kantselyariya distinguished between scientifically trained foreign doctors (Doctor Medicinae) and empirically trained doctors. The first group included doctors, who after basic medical training, had completed postgraduate studies and conducted their own research, which resulted in the defence of a scientific thesis. The second group were referred to as barber-surgeons (folk healers), and this distinction was also reflected in the level of salary.

Significant changes in the management of medical affairs were made by Tsarina Catherine the Great (1763–1796) [6; 17; 19; 20]. In 1763 the Meditsinskaya Kantselyariya was renamed to the Meditsinskaya Kollegiya (Medical Collegium) and it received extended powers. She established a board of directors (Collegium), led by one of the distinguished Doctors Medicinae. In 1764, the Kollegiya was given the right to confer the degree of Doctor Medicinae.

In 1775 provincial medical charitable councils were established in all provinces of the Russian Empire. The councils, which were formed to supervise rural medical affairs, included representatives of all sections of society. Their functions included the organisation of orphanages, alms-houses, hospitals and pharmacies. They fell under the supervision of the Meditsinskaya Kollegiya. In connection with the changes taking place, the number of physicians (including those of Russian origin) steadily increased (Fig. 2).

## Conclusion

Thus, from the 9<sup>th</sup> to the 18<sup>th</sup> century (over 10 centuries), Medicine in Russia went through a long and complicated path. Until the beginning of the 17<sup>th</sup> century, most of the population of Russia did not have access to qualified medical assistance, relying only on folk remedies. Qualified medical care was received only by rich people, it was provided by foreign doctors. Among the foreign doctors were many graduates of the Leiden University, representatives of Holland.

Since the 17<sup>th</sup> century, in Russia significant changes have occurred in the field of Medicine and social welfare. Since the reign of Mikhail Fyodorovich Romanov (1613–1645) many foreign doctors were invited to Russia, including representatives of the Netherlands, graduates of the Leiden University. State institutions were established to organise

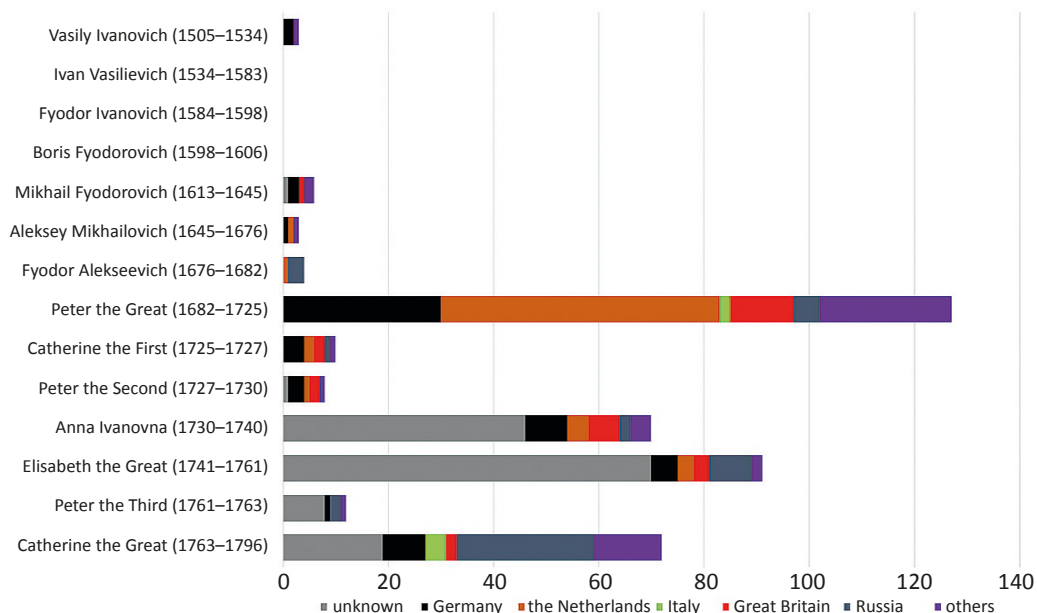


Fig. 2. Numbers of *barbers* and their country of the highest medical education during the reigns of the rulers of Russia.

and supervise the work of pharmacists, doctors *medicinae* and barber-surgeons. As the head of these institutions, talented leaders were appointed. Hermann Kaau-Boerhaave and Pavel Zakharievich Condoidi, Dutch representatives and graduates of the Leiden University played a particularly important role in the development of Russian Medicine in the 18th century. Both were appointed as General Director of the Meditsinskaya Kantselyariya. In 1654 the first medical school was opened in Russia. The treatment of patients in the 17–18<sup>th</sup> centuries advanced from primitive folk to more advanced methods based on science including surgical interventions.

## Acknowledgments

The authors are grateful for the immense help and support they received from Mrs. Liudmila B. Narusova, President of the Anatoly Sobchak Foundation, for access to archives of museums and libraries in Saint Petersburg. They are also thankful to Prof. Dr. A. A. Budko, director of the Military Medical Museum and the Staff of the Military Medical Academy named after SM Kirov in St. Petersburg for their help and enthusiasm.

We wish to express special thanks for the help of the late Mr. Anton N. Gubankov, former head of the Cultural Department, Ministry of Defence of the Russian Federation. Unfortunately, Anton was killed in a plane crash on 25 December 2016. Without his help and support our task in researching, material would have been immensely more difficult. He will be sadly missed.

## References

1. Likhachev D. S. *Tale of the Bygone Years. Here is the tale of the bygone years, where the Russian land came from, who in Kiev was the first ruler, and how the Russianland arose*. Moscow, Augsburg, Im Werden Verlag, 2003. (In Russian)



2. Riasanovsky N.V. *A history of Russia*. 5<sup>th</sup> ed. New York, Oxford, Oxford University Press, 1993. (In Russian)
3. Kuzmin M. K., Sorokina T. S. Medicine in ancient Russia. *Feldsher. Akush*, 1984, no. 49, pp. 31–37. (In Russian)
4. Richter W. M. *History of Medicine in Russia*. 1<sup>st</sup> ed. Vol. 1. Moscow, N. S. Wsewolojsky, 1813.
5. Sorokina T. S. *History of Medicine*. Moscow, Academia, 2008. (In Russian)
6. Richter W. M. *History of Medicine in Russia*. 1<sup>st</sup> ed. Vol. 3. Moscow, N. S. Wsewolojsky, 1817.
7. Garrison F. H. Russian Medicine under the Old Regime. *Bull. N. Y. Acad. Med*, 1931, no. 7, pp. 693–734.
8. Zguta R. Early Russian medicine: potential sources and directions of research. *J. Hist. Med. Allied Sci.*, 1980, no. 35, pp. 203–214.
9. Heine M. *Fragments of the history of medicine in Russia*. 1<sup>st</sup> ed. St. Petersburg, Verlaag von Eggers et Comp., 1848.
10. Dumschat S. *Foreign Physicians in Moscow Russia*. Munich, Franz Steiner Verlag GmbH, 2006.
11. Griffin C. In Search of an Audience: Popular Pharmacies and the Limits of Literate Medicine in Late Seventeenth- and Early Eighteenth-Century Russia. *Bull. Hist. Med*, 2015, no. 89, pp. 705–732.
12. Richter W. M. *History of Medicine in Russia*. 1<sup>st</sup> ed. Vol. 2. Moscow, N. S. Wsewolojsky, 1815.
13. Appleby J. H. Ivan the Terrible to Peter the Great: British formative influence on Russia's medico-apothecary system. *Med. Hist*, 1983, no. 27, pp. 289–304.
14. Richter W. M. *On the history of medicine in Russia. Unpublished notes*. St. Petersburg, Military Medical Museum, 1810–1817, pp. 1–321.
15. Griffin C. Russia and the Medical Drug Trade in the Seventeenth Century. *Soc. Hist Med*, 2018, February, vol. 31, iss. 1, pp. 2–23. <https://doi.org/10.17863/CAM.6171>
16. Oborin N. A. The first Centre for Higher Medical Education in Russia (for the 280<sup>th</sup> anniversary of the Moscow hospital and the Moscow medical-surgical school — the Military Medical Academy named after S. M. Kirov). *Klin. Med. (Mosk.)*, 1990, no. 68, pp. 118–121. (In Russian)
17. Chistovich Y. *History. The first medical school in Russia*. St. Petersburg, Yakova Treya, 1883. (In Russian)
18. Lindeboom G. A. *Herman Boerhaave the man and his work*. 2<sup>nd</sup> ed. Rotterdam, Erasmus Publishing, 2007.
19. Van Esso I. Foreign physicians in Russian State Service, who studied in Holland. *Ned. Tijdschr. Geneeskde*, 1938, no. 82, vol. IV, pp. 5399–5410.
20. Van Esso I. Dutch physicians in Russian court- and state service in the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> century. *Ned. Tijdschr. Geneeskde*, 1938, no. 82, vol. I, pp. 1102–1112.

Received: July 25, 2018  
Accepted: December 3, 2018

#### Author's information:

Inge F. Hendriks — MA; ingefhendriks@gmail.com  
 James G. Bovill — MD, PhD, FCAOI, FRCA; jgbovill@gmail.com  
 Dmitrii A. Zhuravlev — PhD; demetrio\_s@mail.ru  
 Ivan V. Gaivoronsky — MD, PhD; i.v.gaivoronsky@mail.ru  
 Fredrik Boer — MD, PhD; fboer@lumc.nl  
 Pancras C. W. Hogendoorn — MD, PhD; p.c.w.hogendoorn@lumc.nl